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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,849	02/26/2004	James P. Kohler	MANIA044	8459
21921	7590	07/13/2007		
DOV ROSENFELD 5507 COLLEGE AVE SUITE 2 OAKLAND, CA 94618			EXAMINER LEE, JOHN W	
			ART UNIT 2624	PAPER NUMBER
			MAIL DATE 07/13/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/789,849		KOHLER ET AL.	
	Examiner		Art Unit	
	John Wahnkyo Lee		2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 19-34 and 37 is/are pending in the application.
- 4a) Of the above claim(s) 17-18 and 35-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 19-34 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20040322</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-16, 19-34, and 37 drawn to a method of processing an image of a printed circuit board to inspect a hole with specified hole position, classified in class 382, subclass 147.
 - II. Claims 17-18 and 35-36, drawn to a method of calculating an error threshold for determining the acceptability of hole in a print circuit board from CAD/CAM data and a tool table classified in class 382, subclass 270.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination I as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination II has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require obtaining specified hole position from CAD/CAM data and a tool table. The subcombination II has separate utility such as obtaining specified hole position from CAD/CAM data and a tool table.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all

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the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions

unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

2. Applicant's election without traverse of invention I in the reply filed on 28 June 2007 is acknowledged.

Information Disclosure Statement

3. An initialed and dated copies of Applicant's IDS form 1449-Paper No. 20040322, is attached to the instant Office action.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Oath/Declaration

5. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

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The oath or declaration is defective because:

It does not state that the person making the oath or declaration has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Regarding claims 19 and 27, the claims are rejected under 35 U.S.C. 101

because the claimed invention is directed to non-statutory subject matter. Generally, carrier medium encoding a program can even include networks sending bit streams or antennas receiving and transmitting signals or carrier waves. Signals or carrier waves are forms of energy per se and do not fall within a statutory category invention, for energy is clearly not a series of steps or acts to constitute process, not a mechanical device or combination of mechanical devices to constitute a machine, not a tangible physical article or object which is some form matter to be a produce and constitute a manufacture, and not a composition of two or more substances to constitute a composition matter.

Claims 20-26 and 28-34 mirror and do not overcome the deficiency enumerated for claims 19 and 27, respectively. Therefore, claims 20-26 and 28-34 should likewise be rejected as non-statutory.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-16, 19-34, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Bishop (US 4,893,346).

Regarding claim 1, Bishop discloses a method of processing an image of a printed circuit board (PCB) to inspect a hole with a specified hole position on said PCB, where said specific hole position is over a conductive pad on the surface of said PCB defining a pad edge, comprising (abstract; col. 4, lines 1-7; col. 11, col. 1-8): processing said image to determine the amount of said pad within a first region of said image (col. 2, lines 43-55); comparing the amount of pad material within a first region with an error threshold (col. 10, lines 55-68; "tolerance"); and providing an indication of the acceptability of said hole from the results of said comparing (col. 11, lines 25-29; "indication of error").

Regarding claim 2, Bishop discloses the amount of said pad within said first region is proportional to the number of pixels of said image within said first region (col. 5, lines 65-68; col. 6, lines 1-5).

Regarding claim 3, Bishop discloses the first region corresponds to the specified hole position (Fig. 8).

Regarding claim 4, Bishop discloses that the first region is larger than and includes the specified hole position (Fig. 8-B1, Fig. 8-B2, and Fig. 8-B4).

Regarding claim 5, Bishop discloses that the processing includes filtering said image to differentiate said pad from said hole and from said PCB surface (Fig. 8).

Regarding claim 6, Bishop discloses that the error threshold is a predetermined proportion of the area of said first region (Fig. 8; col. 11, lines 1-24)

Regarding claim 7, Bishop discloses that the error threshold is determined from an indication of the diameter of said hole, and an indication of the diameter of said pad, and an indication of the minimum width of the pad material between said hole and said pad edge (Fig. 8; col. 11, lines 1-29).

Regarding claim 8, Bishop discloses that the pad edge is approximately circular and is centered about said specified hole position, and wherein said error threshold corresponds to the amount of pad within the area of the specified hole position resulting in a minimum width of said pad between said hole and pad edge (Fig. 8; col. 11, lines 1-29).

Regarding claim 9, Bishop discloses a method of processing an image of a printed circuit board (PCB) in an Automated Optical Inspection system to determine the acceptability of a hole with a specified hole position on said PCB, where said specified hole position is over a conductive pad on the surface of said PCB defining a pad edge, comprising (Figs. 1, 5, and 6B; abstract; col. 4, lines 1-7; col. 11, col. 1-8): processing said image to determine the location of said pad within a first region that includes said specified hole position (col. 2, lines 1-5, col. 3, lines 67-68; col. 4, lines 1-7);

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determining an amount of said pad within said first region (col. 2, lines 43-55);
determining an error threshold of said material within said first region (Fig. 8; col. 11, lines 4-8); and providing an indication that said hole is unacceptable if said amount of said pad material within said region exceeds said error threshold (col. 11, lines 25-29; "indication of error").

Regarding claim 10, Bishop discloses the amount of said pad within said first region is proportional to the number of pixels of said image within said first region (col. 5, lines 65-68; col. 6, lines 1-5).

Regarding claim 11, Bishop discloses the first region corresponds to the specified hole position (Fig. 8).

Regarding claim 12, Bishop discloses that the first region is larger than and includes the specified hole position (Fig. 8-B1, Fig. 8-B2, and Fig. 8-B4).

Regarding claim 13, Bishop discloses that the processing includes filtering said image to differentiate said pad from said hole and from said PCB surface (Fig 8).

Regarding claim 14, Bishop discloses that the error threshold is a predetermined proportion of the area of said first region (Fig. 8; col. 11, lines 1-24).

Regarding claim 15, Bishop discloses that the error threshold is determined from an indication of the diameter of said hole, and an indication of the diameter of said pad, and an indication of the minimum width of the pad material between said hole and said pad edge ((Fig. 8; col. 11, lines 1-29).

Regarding claim 16, Bishop discloses that the pad edge is approximately circular and is centered about said specified hole position, and wherein said error threshold

corresponds to the amount of pad within the area of the specified hole position resulting in a minimum width of said pad between said hole and pad edge (Fig. 8; col. 11, lines 1-29).

Regarding claim 19, Bishop discloses a carrier medium carrying one or more computer readable code segments to instruct a processor of a processing system to implement a method of processing an image of a printed circuit board (PCB) to inspect a hole with a specified hole position on said PCB, where said specific hole position is over a conductive pad on the surface of said PCB defining a pad edge (Fig. 1 and Fig. 5). Claim 19 is analogous and corresponds to claim 1. See rejection of claim 1 for further explanation.

Regarding claim 20, claim 20 is analogous and corresponds to claim 2. See rejection of claim 2 for further explanation.

Regarding claim 21, claim 21 is analogous and corresponds to claim 3. See rejection of claim 3 for further explanation.

Regarding claim 22, claim 22 is analogous and corresponds to claim 4. See rejection of claim 4 for further explanation.

Regarding claim 23, claim 23 is analogous and corresponds to claim 5. See rejection of claim 5 for further explanation.

Regarding claim 24, claim 24 is analogous and corresponds to claim 6. See rejection of claim 6 for further explanation.

Regarding claim 25, claim 25 is analogous and corresponds to claim 7. See rejection of claim 7 for further explanation.

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Regarding claim 26, claim 26 is analogous and corresponds to claim 8. See rejection of claim 8 for further explanation.

Regarding claim 27, Bishop discloses a carrier medium carrying one or more computer readable code segments to instruct a processor of a processing system to implement a method of processing an image of a printed circuit board (PCB) in an Automated Optical Inspection system to determine the acceptability of a hole with a specified hole position on said PCB, where said specified hole position is over a conductive pad on the surface of said PCB defining a pad edge (Fig. 1 and Fig. 5). Claim 27 is analogous and corresponds to claim 9. See rejection of claim 9 for further explanation.

Regarding claim 28, claim 28 is analogous and corresponds to claim 10. See rejection of claim 10 for further explanation.

Regarding claim 29, claim 29 is analogous and corresponds to claim 8. See rejection of claim 11 for further explanation.

Regarding claim 30, claim 30 is analogous and corresponds to claim 12. See rejection of claim 12 for further explanation.

Regarding claim 31, claim 31 is analogous and corresponds to claim 13. See rejection of claim 13 for further explanation.

Regarding claim 32, claim 32 is analogous and corresponds to claim 14. See rejection of claim 14 for further explanation.

Regarding claim 33, claim 33 is analogous and corresponds to claim 15. See rejection of claim 15 for further explanation.

Regarding claim 34, claim 34 is analogous and corresponds to claim 16. See rejection of claim 16 for further explanation.

Regarding claim 37, Bishop discloses an apparatus for inspecting holes of a printed circuit board (PCB) to compare the position of a hole with a specified hole position on said PCB, where said specific hole position is over a conductive pad on the surface of said PCB defining a pad edge, comprising ((Figs. 1, 5, and 6B; abstract; col. 4, lines 1-7; col. 11, col. 1-8): a camera to image a hole having a region of interest about said hole (Figs. 1 and 5, "CCD"; col. 5, lines 1-48); and a computer to accept instructions to process said image to determine the amount of said pad within said region of interest and having means to provide an indication of the acceptability of said hole from the amount of said pad material within said region of interest (Fig. 1, "FOV processor" and "computer or processor ...").

Conclusion

9. Claims 1-16, 19-34, and 37 are only considered for examination based on the invention selected from the applicant after the requirement for restriction/election.

10. All the claims examined are rejected.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Wahnkyo Lee whose telephone number is (571) 272-9554. The examiner can normally be reached on Monday - Friday (Alt.) 7:30 a.m. - 5:00 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

John W. Lee
(AU 2624)



JINGGE WU
SUPERVISORY PATENT EXAMINER